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TROP PRUNER & HU, PC
1616 S. VOSS ROAD, SUITE 750
HOUSTON, TX 77057-2631

EXAMINER
DUPUIS, DEREK L

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/669,938
Filing Date: September 24, 2003
Appellant(s): BHOWMIK, ACHINTYA K.

Timothy N. Tropp (Reg. No. 28,994)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/11/2006 appealing from the Office action mailed 8/4/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2002/0168165	Chien et al	11/2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-15 are rejected under 35 U.S.C. 102(e) as being anticipated by ***Chien et al (US 2002/0168165, hereinafter "Chien").***

Regarding claim 1, Chien teaches a method comprising determing an amount of dispersion in an optical system. Specifically, in paragraph 52, Chien teaches that an amount of polarization mode dispersion (PMD) in an optical signal is measured by a detector (see lines 5-8 of paragraph 52). Chien teaches applying an amount of stress to an optical medium to provide dispersion compensation for the determined amount of dispersion. Specifically, in paragraph 52, Chien teaches that based on the detected amount of dispersion, a processor controls a dispersion compensator (specifically, a series of piezoelectric actuators) to lower the amount of PMD in the signal (see lines 8-12 of paragraph 52). In paragraph 41, Chien teaches that the piezoelectric actuators (also called "mechanical squeezers") compensate for PMD in fibers. In paragraphs 8-10, Chien teaches that the amount of stress can control the amount of compensation in a PMD compensator.

Regarding claim 2, Chien teaches a method as discussed above in reference to claim 1. Chien teaches that stress is applied to a photoelastic medium to generate a corrective PMD of the opposite polarity of a dispersion induced in the medium (see paragraphs 8-10).

Regarding claim 3, Chien teaches a method as discussed above in reference to claim 2. Chien teaches that piezoelectric devices are used to generate stress (see paragraphs 8-10).

Regarding claim 4, Chien teaches a method as discussed above in reference to claim 3. Chien et al teaches that the amount of stress determines the amount of PMD compensation

applied to the medium (see paragraphs 8-10). Chien teaches that the actuators are controlled based upon the applied voltages (see paragraph 52).

Regarding claim 5, Chien teaches a method as discussed above in reference to claim 4. Chien et al teach that the piezoelectric actuators are attached the medium (the fiber) and that an optical signal is passed through the medium (see paragraphs 50-53).

Regarding claim 6, Chien teaches a method comprising securing a photoelastic medium to a piezoelectric device. Specifically, in paragraphs 41 and 47-52, Chien et al teach that the piezoelectric actuators (also called "mechanical squeezers") are secured to the fibers of the PMD compensation device. Chien teaches determing an amount of dispersion in an optical system. Specifically, in paragraph 52, Chien teaches that an amount of polarization mode dispersion (PMD) in an optical signal is measured by a detector (see lines 5-8 of paragraph 52). Chien teaches applying an amount of stress to an optical medium to provide dispersion compensation for the determined amount of dispersion. Specifically, in paragraph 52, Chien teaches that based on the detected amount of dispersion, a processor controls a dispersion compensator (specifically, a series of piezoelectric actuators) to lower the amount of PMD in the signal (see lines 8-12 of paragraph 52). In paragraph 41, Chien teaches that the piezoelectric actuators (also called "mechanical squeezers") compensate for PMD in fibers. In paragraphs 8-10, Chien teaches that the amount of stress can control the amount of compensation in a PMD compensator. Chien teaches variably applying a tunable voltage in paragraph 52. The voltage signal sent to the piezoelectric device is varied so as to desirably control the amount of compensation (see lines 8-12 of paragraph 52). The tunable voltage signal is varied based upon the amount of dispersion measured by the detector (see lines 5-12 of paragraph 52). To

summarize, the detector measures the dispersion present in the medium and determines an amount of dispersion. Based upon this measured dispersion, the processor sends a voltage signal that desirably controls the various piezoelectric actuators of the compensator so as to compensate for the measured dispersion. This process is continuously performed as the system is set in a feedback loop (see paragraph 50). The detector continuously measures the dispersion in the system and variably applies a tunable voltage to the piezoelectric device that controls the various piezoelectric actuators that induce stress on the medium to result in desired amount of PMD compensation (see paragraphs 50-52).

Regarding claims 7 and 8, Chien teaches a method as discussed above in reference to claim 6. Chien also teaches controlling the voltage applied to the piezoelectric device to generate a dispersion of substantially the same magnitude and an opposite polarity of the dispersion generated in the optical system (Figs 1-4, and paragraphs 3, 8-10, 12, 41, 42, 45, 47, 50-52). The dispersion compensation is tuned based on the voltage level. The voltage is tuned based on the amount of dispersion detected in the medium (see paragraphs 50-52).

Regarding claims 9-15, Chien discloses an optical system (400) comprising: an optical medium (305) defining an optical path; a photoelastic material in the optical path; devices (piezoelectric actuators) (307 or 402) that tunably stress the photoelastic medium to variably generate a dispersion of an appropriate polarity and magnitude to correct a determined dispersion inducted in the optical medium, the piezoelectric actuators are coupled/secured to the photosensitive medium to provide a tunable magnitude and polarity of dispersion to cancel dispersion generated along the optical path by the optical medium (Figs 1-4; and paragraphs 3, 8-10, 12, 41, 42, 45, 47, 50-52). The piezoelectric actuators tunably apply stress so as to tunably

control the varying levels of dispersion in the medium (see specifically, paragraphs 50-52). The determined amount of dispersion is measured by the detector element which sends a signal to a processor. The processor sends a signal to a tunable piezoelectric device that includes multiple piezoelectric actuators. The signal controls the actuators so as to controllably apply stress to the medium so as to compensate for the determined amount of dispersion (see paragraphs 50-52).

(10) Response to Argument

A. Are Claims 1-15 Anticipated Under 35 U.S.C. 102(e) by Chien et al.?

The appellant's arguments only address the rejection of claim 1.

In response to appellant's arguments, the examiner believes that the appellant has misinterpreted the disclosure of Chien et al. The appellant argues that Chien "merely determines whether there is dispersion and, if so, simply [applies] a corrective signal to reduce the amount of dispersion" and that the system "[applies] the same fixed correction to reduce the dispersion over and over and over, until the dispersion is zero, if enough time is available." This is a gross misrepresentation of the Chien et al reference.

Chien et al teach a polarization mode dispersion compensator (400) as shown in figure 4. The system includes two sections (100 and 300) shown in detail in figures 1 and 3 respectively. Each section includes two or more piezo-electric actuators (mechanical squeezers) (110, 112, 114, 308 and 310) that are controlled by signals from a processor (402).

In paragraph 44, Chien et al explains that a degree of control is established by varying the magnitude of the mechanical stress applied by an associated mechanical squeezer.

As shown in figure 4, and as explained in paragraphs 50-53, a detector (406) is used to detect an amount of dispersion in the system (see paragraph 52) and converts this output into a

DC voltage, which is then provided to a processor (402). The processor desirably controls the piezoelectric actuators (mechanical squeezers) in response to the detector output to lower the dispersion. As summarized again in paragraph 53, the signals applied to the piezoelectric actuators are based upon the "amount of dispersion exhibited" in the system.

Nowhere does Chien state (as argued by appellant) that the dispersion compensation is based on the "whether there is dispersion." Chien positively states that it is the "amount of dispersion" that bases the control signals and thus the mechanical stress applied to the system to compensate for dispersion (see paragraph 53). Furthermore, Chien does not teach a "fixed correction" amount as suggested in appellant's argument, but rather teaches that the stress is controlled by the amount of dispersion detected in the system (see paragraphs 52 and 53).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Derek L. Dupuis

Conferees:

Frank Font Frank G Font

Georgia Epps Georgia Y Epps

Trop, Pruner & Hu, P.C.
Timothy N. Trop
1616 S. Voss Rd. Suite 750
Houston, Texas 77057-2631